

SYSTEM AND METHOD FOR CONSTRUCTING AND DISPLAYING ACTIVE
VIRTUAL REALITY CYBER MALLS, SHOW ROOMS, GALLERIES, STORES,
MUSEUMS, AND OBJECTS WITHIN

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PRIORITY NOTICE

1. This Non-Provisional U.S. Patent Application claims the benefit of the August 6, 1999 filing date of Provisional U.S. Patent Application Serial Number 60/147,716.

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3. The present invention is related to constructing panoramic, virtual-reality Cyber/Electronic (Cyber) show-rooms, galleries, stores, or malls (show-rooms) in electronic media, displaying such cyber shown-rooms on-line on remote terminals or client/user computers, allowing the viewers at the computer terminals or client/user-computers to select objects displayed in the cyber virtual-reality show-rooms on-line, and retrieve and review remote data related to the selected objects.

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Description of Related Art

4. In the brick-and-mortar world, showrooms, galleries, and stores are used to display furnishing, interior accessories, fashion, art, antiques, or other objects. Shopping centers, malls, and main streets are constructed to aggregate a large number of stores. The on-line equivalent of such commerce components are constructed with database containing information for such objects or stores sorted with nesting categories. The objects in conventional cyber stores, galleries, and show rooms are represented on the client/user computer screens as index lists of textual or thumbnail entries. The stores in a conventional cyber-mall are represented by a collection of "banner" entries (see Figures 1A1, 1A2, 1B, 1C1, 1C2, 1C3, 1D1, 1D2, 1E1, 1E2, 1E3, 1E4, 1E5, 1F). Thumbnails are small graphical representation of an object, serving as an index and a link to detailed information regarding the object. Banner is a small graphical box-like icon with the logo and name of a business entity on the Web Clicking on a thumbnail usually brings an enlarged photograph and/or descriptions of the object from the server database to the client/user's computer screen. Clicking on a "banner" brings the user to the home page of the business entity the banner represents.

5. A typical on-line gallery or store, for example, would show category titles of the gallery collections or store items, with some textual entries or graphical thumbnails of selected "featured" exhibits or items. When a particular "last stop" category on a particular categorical path is clicked, the items or objects sorted under that category are presented in an index list of textual one-line

entries or thumbnail entries. The index list could be very long, and partitioned into many web pages (each may be several print pages long), accessible one-web page-at-a-time. Clicking on a textual or thumbnail entry or brings detailed textual description and an enlarged version of the thumbnail, if available, again, only one-at-a-time (see Figures 1A1 and 1A2).

6. Virtual Reality software, such as Apple Computing Quick Time, or Macromedia Flash, on the other hand, has been developed to show scrolling panoramic views of a room or a scene, or to rotate a three-dimensional object to show its 360-degree views. The Virtual Reality source data is typically prepared by shooting multiple still photographs of a room, a scene, or an object from sequentially varying angles, and re-compose the still photographs in the correct spatial-time sequence to form a contiguous panoramic view. Video filming can also be used. Viewing the Virtual Reality image at the viewer's computer screen is controlled by the "mouse," a computer input device (see Figures 2A, 2B, and 2C) and the control buttons on the VR "viewing window" on the computer screen. The panoramic view of a scene is scrolled across the viewing window. The still shots from sequentially varying angles of a 3-D object is "flashed" onto the VR viewing window, producing an illusion of the object rotating in the window, given a large enough number of still shots, and fast enough speed of spatial-time re-composition or "flashing."

7. Virtual Reality has not been used in actionable on-line or electronic commerce environment, except for viewing purposes only, such as displaying a

property or a house on-line on Real-Estate listing sites as in Figures 2A, 2B, and 2C; or, rotating a 3-D object, such as a car on car sites; or, for other purely entertainment purposes, such as displaying the content of a museum. In all cases, the Virtual Reality graphical data packet is treated as a single data entity with a single "packet address," accessed by clicking a VR or 3D button, and viewed by controlling the temporal scanning or rotation using the control buttons on the computer screen in conjunction with the button on the input device, the mouse. From within the Virtual Reality data packet, there is no link to the external world outside the data packet. Therefore, there is no practical application other than its visual and entertainment value. One cannot do anything with the Virtual Reality presentation of the known-art, other than looking at it and enjoying it.

SUMMARY OF THE INVENTION

8. The present invention relates to methods and apparatus to construct and display electronic/cyber/on-line showrooms, galleries, stores and malls to emulate the physical brick and mortar world, in addition to the conventional category and index listing e-commerce construct of the Web. Virtual Reality (VR) shots and/or Video films are made to visually present a show room, gallery, store, or object with more resemblance to the physical world we live. Each still picture of the VR shots or each frame of the video film is given a

unique frame address. Each significant and unique object in the VR data packet is given a unique identification, indexed and addressed by the area the object occupies in a picture or a frame. Links are associated with each such object, such that detailed information (such as graphical, video, audio, or textual descriptions) related to the objects stored external to the VR data packet, can be retrieved from the database on demand, when the objects in the VR images are "selected"/"clicked."

BRIEF DESCRIPTION OF THE DRAWINGS

9. FIG. 1A1 illustrates prior art on-line malls, stores, galleries, and showrooms.
10. FIG. 1A2 illustrates a prior art AOL Mall having a collection of department stores represented by banners. Other types of stores are sorted under categories, and accessed through the category listing at the bottom of the page.
11. FIG. 1B illustrates a prior art AOL Apparel Store's listing.
12. FIGS. 1C1, 1C2 and 1C3 illustrate a prior art dEliAs.Com store listed under the AOL Apparel Stores.
13. FIGS. 1D1 and 1D2 illustrate prior art Artnet.Com Galleries.
14. FIG. 1E1 illustrates a prior art Ebay home page.
15. FIGS. 1E2 through 1E4 illustrate prior art Ebay Galleries.

16. FIG. 1E5 illustrates a prior art first print page of the first web-page of a 36 web-page Ebay Furniture listing.
17. FIG. 1F illustrates a prior art Design Toscano Cyber Show Room.
18. FIGS. 2A, 2B and 2C illustrate prior art Virtual Reality: Virtual touring of
5 a home displayed on the www.bamboo.com web site. There is no other function beyond the visual tour: scrolling the panoramic image to the left, to the right, and look at it.
19. FIG. 3A illustrates a central scene and the primary object of a Virtual Reality presentation of a museum hall with small buttons at the lower left corner
10 to scroll the panoramic scene of the Hall to the left, right, up, down, and zoom-in, and pan-out.
20. FIG. 3B illustrates nine Virtual Reality frames around the central object in the hall, scanning from the left of the object through the object, to the right of the object, each assigned its unique frame identity in the present
15 invention.
21. FIG. 3C illustrates a rectangular area closely surrounding the object that is cut, and marked out and identified separately from the rest of the picture/frame in accordance with the present invention.
22. FIG. 3D illustrates an example of data stored in memory space
20 external to the Virtual Reality data packet, linked to the object image from within the Virtual Reality data packet.

23. FIG. 3E illustrates the object with control buttons at the lower left corner resulting from activation of the "Virtual Reality" button in FIG. 3D in accordance with the present invention.

24. FIG. 3F illustrates 12 of the standard 36 frames shot from equally spaced angles 360-degrees around the object in accordance with the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENT OF THE INVENTION

25. Referring again to prior art FIG. 2A, clicking on the "Exterior Front" selection on the menu at the left side, initiates the downloading of the "panoramic image of the exterior front view of the house from the server database, as noted under the "Bamboo.com/Virtual Tour" logo at the center of the page.

26. Referring again to prior art FIG. 2B, when the downloading of the panoramic image is complete, the exterior scene of the home scrolls across the "VR window" on the computer screen. The buttons on the lower left corner of the VR window are control buttons activated by the computer mouse. By moving the cursor to the "left" arrow, and pressing down on the left mouse button, the image scrolls to the left, bringing the portion of the panoramic image beyond the right margin of the window into view. Pressing on the left button of the mouse while the cursor is resting at the "right" arrow, scrolls the image to the right.

The "square" button stops the scrolling, and the "b" button is for clicking "back" to the previous page, which is the home page.

27. Referring now to prior art FIG. 2C, clicking on the "Master Bedroom" selection on the menu at the left side of the page, causes the "panoramic" image of the master bedroom, to download from the site-server to the client/user's computer screen. The scrolling and stopping functions are identical to those in FIG. 2B.

28. The present invention relates to methods and apparatus to construct and display electronic/cyber/on-line showrooms, galleries, stores and malls to emulate the physical showrooms, galleries, stores, and malls. Virtual Reality (VR) shots with audio segments, and/or Video films are made to visually, audibly, and contiguously present a show room, gallery, store, or object. Each still picture 32A of the VR shots or each frame 30a, 30b, 30c, 30d, 30e, 30f, 30g, 30h, and 30i of the video film is given a unique frame address within the VR packet address. Thus, each picture 32A or each frame 30a, 30b, 30c, 30d, 30e, 30f, 30g, 30h, and 30i is identifiable via the address of the packet and the address of the frame 30a, 30b, 30c, 30d, 30e, 30f, 30g, 30h, and 30i. Each significant and unique object 32 in the VR data packet, is given an unique identification, indexed by the area 50 the unique object 32 occupies in the frames 30a, 30b, 30c, 30d, 30e, 30f, 30g, 30h, and 30i or pictures 32A containing the object. Links are assigned to that unique object 32, which may appear in multiple frames, such that detailed information (such as graphical, VR, video, audio, or textual descriptions) related

to the object 32 addressed by the links, can be retrieved from the database external to the VR data packet, on demand, such as when the object 32 in the proximity frames is "clicked," from any of the proximity frames.

29. Clicking on a particular object 32 in a frame 30a, 30b, 30c, 30d, 30e, 30f,
5 30g, 30h, and 30i, or in any of the proximity frames 30b, 30c, 30d, 30e, 30f, 30g,
and 30h in a VR presentation of a show room, gallery, or store, would select the
link/links associated with the particular object 32 clicked, and store the links in a
file on the client/user computer. Multiple objects can be "clicked," – i.e., selected,
within a VR presentation. When the viewing and the selection process is
10 completed, and the collection of "clicked" links is submitted to the server, by
clicking a "submit" button, all data, whether video, audio, VR, graphics, or
textual, addressed by the links submitted are brought from the server database to
the client/user/user computer with reference to each selected object.

30. FIG. 3A shows the central scene about a primary object 32, Venus of
15 Milo of a Virtual Reality presentation of a museum hall. The small buttons 25 at
the lower left corner scrolls the panoramic scene of the Hall to the left, right, up,
down, and zoom-in and pan-out. A selected set of nine frames 30a, 30b, 30c, 30d,
30e, 30f, 30g, 30h, and 30i around the primary object 32 in this example, are
shown in FIG. 3B. The limit of the conventional Virtual Reality of the known-art
20 is here. There is no interaction or linking mechanism from inside the Virtual
Reality images, such as these frames, to data outside of the VR packet. In FIG.

3B, there are nine Virtual Reality frames 30a, 30b, 30c, 30d, 30e, 30f, 30g, 30h, and 30i around the primary object 32 in the hall, scanning from the left of the object through the object, to the right of the object, each assigned its unique frame identity in the present invention.

5 31. In our implementation, each frame 30a, 30b, 30c, 30d, 30e, 30f, 30g, 30h, and 30i in the Virtual Reality data packet is given an identification. A primary object 32 that appears in multiple proximity frames would be "cut out" from the rest of each frame, or the scene, and given a unique identification, and assigned a link, or a collection of links, to link to external data storage space that stores data
10 associated with the object 32. The primary object 32 appearing on several proximity frames, such as from FIG. 3B – frame 30b through frame 30h, would be identified as one object, and given the same set of links.

32. A rectangular area 50 closely surrounding the object 32 in all of the proximity frames is cut as shown in FIG. 3C, and marked out and separated from
15 the rest of the frame in order to be assigned a separate and unique identity to the object 32. This is done for frame 30b through frame 30h in FIG. 3B. The rectangular area 50 in all 7 frames 30b, 30c, 30d, 30e, 30f, 30g and 30h are assigned the same identity representing the object 32, and the same links to the memory space external to the Virtual Reality Frames, containing the detailed
20 information related to the object 32. Clicking within the rectangular area 50 in all 7 frames 30b, 30c, 30d, 30e, 30f, 30g and 30h results in linking to the same set of data.

33. FIG. 3D shows an example of data that can be stored in memory space external to the Virtual Reality data-packet, and linked to the object image within the Virtual Reality data packet. Audio read out of stories and descriptions of the an enlarged still image 32A, textual descriptions 34 and actionable “buy” or “bid” functional frames, video, or VR can all be linked and called on demand. In this example, the enlarged still image 32A in FIG. 3D is further linked to another Virtual Reality data packet that presents the object in 360-degree rotation.

34. Referring now to FIG. 3E, clicking the “Virtual Reality” button 70 in FIG. 3D, brings the “rotating” Virtual Reality data packet of the object, with the control buttons 25 at the lower left corner. FIG. 3F shows the 12 of the standard 36 frames 80a, 80b, 80c, 80d, 80e, 80f, 80g, 80h, 80i, 80j, 80k and 80l shot from equally spaced angles, 360-degrees around the object. When the number of shots and the speed of sequentially “flashing in” the still images into the viewing window are compatible, human eyes perceive that the object rotates on the viewing window. A larger number of shots would permit a smoother and slower rotation.

35. The invention enables practical and actionable commerce applications of Virtual Reality and Video casting or streaming technologies on the web, for example, in displaying objects in show rooms, galleries, stores, or stores in malls, shopping centers, or on main streets in a “real life” format, in addition to the conventional categorization, search, and listing presentations in the conventional web stores and galleries. The current invention enables object images to be linked

to additional textual, audio, graphical, video, or VR data stored in the database outside of the Virtual Reality or Video data packet. Clicking on the image of a sofa in such an "active Virtual Reality" show room of this invention for example, of an interior furnishing show room, would deposit the links associated with the image to a temporary file. When the entire VR or Video presentation is viewed, and the selection of multiple interested objects shown in the VR presentation is completed, the collection of links of the objects selected is submitted to the server from the client/user computer, to retrieve data addressed by the submitted links, including but not limited to detailed audio or textual descriptions, additional graphics or VR presentations, pricing information and ordering/ or buying submission mechanism, sorted and presented by each object at command.

36. The present invention is implemented using software which can be written in many programming languages, or implemented with many web-page generation tools. The present invention can be used on a global or local computer network, on a personal computer, on viewable storage media such as a CD ROM, on a wireless telephone, on a wireless personal assistant such as a Palm Pilot®, or on any type of wired or wireless device that enables digitally stored information to be viewed on a display device. Also, information displayed and viewed using the present invention can be printed, stored to other storage medium, and electronically mailed to third parties.

37. Numerous modifications to and alternative embodiments of the present invention will be apparent to those skilled to the art in view of the foregoing

description. Accordingly, this description is to be construed as illustrative only and is for the purpose of teaching those skilled in the art the best mode of carrying out the invention. Details of the structure may be varied substantially without departing from the spirit of the invention and the exclusive use of all
5 modifications which come within the scope of the appended claims is reserved.